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| 09/864,060 | 05/23/2001 | Hiroshi Fuji | 55944 (70904) | 1977 |

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EDWARDS & ANGELL, LLP
P.O. BOX 55874
BOSTON, MA 02205

EXAMINER

CASTRO, ANGEL A

| ART UNIT | PAPER NUMBER |
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2653

DATE MAILED: 03/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/864,060

Applicant(s)

FUJI ET AL.

Examiner

Angel A Castro

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) 18-22 and 28-31 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17, 23-27, 32 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>4</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of invention I in Paper No. 8 is acknowledged.
2. Claims 18-22, 28-31 withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in Paper No. 8.

Priority

3. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Specification

4. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for

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purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1-2, 9-10, 12-14 are rejected under 35 U.S.C. 102(e) as being anticipated by Ueyanagi (U.S. Pat. 6,396,776).

Regarding claim 1, Ueyanagi discloses an information write/read head for a heat-assisted read/write system wherein a recording track on a recording medium is partially heated by projecting thereto a light beam (figures 10-11), comprising:

a magnetic head 11 for magnetically recording or reading information with respect to the recording track; and

an optical slit 13, which allows the light beam for use in heating the recording track to pass therethrough to be guided to the recording track,

wherein the optical slit includes a light emitting section whose width is shorter than a diffraction limit of the light beam (see figure 11C and column 10, lines 18-20).

Regarding claim 2, Ueyanagi discloses that the light emitting section of the optical slit has a length in a longitudinal direction of not shorter than the diffraction limit of the light beam (see figure 11C).

Regarding claim 9, Ueyanagi discloses that the magnetic head and the optical slit are formed in one integral part (see figure 22A).

Regarding claim 10, Ueyanagi shows a heat-shielding layer 116a (figure 12) formed between the magnetic head and the optical slit.

Regarding claim 12, Ueyanagi discloses that the optical slit is formed in front of the magnetic head in a scanning direction of the recording tracks (see figure 10A).

Regarding claim 13, Ueyanagi discloses an information writing/reading device for a heat-assisted read/write system wherein a recording track on a recording medium is partially heated by projecting thereto a light beam (figures 10A and 22), comprising:

an information write/read head 1 which includes

i) a magnetic head 11 for magnetically recording or reading information with respect to the recording track; and

ii) an optical slit 13 which allows the light beam for use in heating the recording track to pass therethrough to be guided to the recording track, wherein the optical slit includes a light emitting section whose width is shorter than a diffraction limit of the light beam (see figure 11C);

an optical system for guiding the light beam to a light incident section of the optical slit (see figures 10A and 22).

Regarding claim 14, Ueyanagi discloses that::

the optical system includes a semiconductor laser device 2, and

the semiconductor laser device is formed in such a manner that its laser output end face is put together with the light incident section of the optical slit (see figure 22).

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7. Claims 1-3, 6-8, 11-13, 16-17, 23-24, 26-27 and 32 are rejected under 35

U.S.C. 102(e) as being anticipated by Hasegawa et al (U.S. Pat. 6,563,781).

Regarding claim 1, Hasegawa et al discloses an information write/read head for a heat-assisted read/write system wherein a recording track on a recording medium is partially heated by projecting thereto a light beam (figures 4-7), comprising:

a magnetic head for magnetically recording or reading information with respect to the recording track (column 9, lines 56-62); and

an optical slit 62a (figure 7) which allows the light beam for use in heating the recording track to pass therethrough to be guided to the recording track,

wherein the optical slit includes a light emitting section whose width is shorter than a diffraction limit of the light beam (see column 5, lines 52-55).

Regarding claims 2 and 24, Hasegawa et al discloses that the light emitting section of the optical slit has a length in a longitudinal direction of not shorter than the diffraction limit of the light beam (see column 5, lines 52-55).

Regarding claim 3, Hasegawa et al discloses that the optical slit is formed in such a manner that a longitudinal direction of the light emitting section intersects with a longitudinal direction of a magnetic gap of the magnetic head (column 6, lines 65-67, column 7, lines 1-2 and figures 4-5).

Regarding claim 6, Hasegawa et al shows that the optical slit has a light incident section of a larger area than the light emitting section (see figure 7).

Regarding claim 7, Hasegawa et al shows that the optical slit has two side parts facing one another which extend from the light incident section to the light emitting section, the two side parts being inclined with respect to a light incident direction (see figure 7), and

the two side parts totally reflect light incident from the light incident section.

Regarding claim 8, Hasegawa et al discloses that the optical slit is made of a light-transmissive material (column 9, line 32).

Regarding claim 11, Hasegawa et al discloses that the optical slit is formed in such a manner that its longitudinal direction is substantially parallel to a longitudinal direction of the recording tracks (column 6, lines 62-67, where the angle α is close to zero).

Regarding claim 12, it is inherent in the reference to Hasegawa et al that the optical slit is formed in front of the magnetic head in a scanning direction of the recording tracks (see figure 5).

Regarding claims 13, 16, 23 and 26, Hasegawa et al discloses an information writing/reading device for a heat-assisted read/write system wherein a recording track on a recording medium is partially heated by projecting thereto a light beam, comprising:

an information write/read head (figure 8), which includes

i) a magnetic head for magnetically recording or reading information with respect to the recording track (column 9, lines 56-62); and

ii) an optical slit (figure 7) which allows the light beam for use in heating the recording track to pass therethrough to be guided to the recording track, wherein the optical slit includes a light emitting section whose width is shorter than a diffraction limit of the light beam;

an optical system for guiding the light beam to a light incident section of the optical slit (see figure 6).

Regarding claim 16, Hasegawa et al further discloses:

a slider 60 for scanning on an information writing/reading disk as a recording medium;

writing means for outputting a writing signal with respect to the magnetic head; and

reading means for inputting a reading signal from the magnetic head (see figure 6).

Regarding claims 17 and 27, Hasegawa et al discloses tracking means which detects a light beam transmitted through or reflected from the recording medium, which has passed through the optical slit, and performs a tracking operation of the recording tracks based on the transmitted light or the reflected light as detected (figure 6).

Regarding claim 25, it is inherent in the reference to Hasegawa that a polarized direction of the light beam to be incident onto the optical slit is determined based on the longitudinal direction of the optical slit (since the width of the slit is shorter than the diffraction limit of the light beam, the polarization needs to be parallel to the length of the slit in order to have enough power to heat up the recording medium).

Regarding claim 32, Hasegawa et al discloses a tracking device which performs a tracking operation with respect to an information recording medium comprising tracking-use marks formed along recording tracks, whereon information are recorded based on changes in refractive index, wherein the tracking-use marks have a length of not shorter than a diffraction limit of a light beam in a direction along the recording tracks and a width of not wider than the diffraction limit of the light beam in a direction orthogonal to the recording tracks (figure 6), the tracking device comprising:

an optical slit (figure 7) which allows a light beam to pass therethrough to be guided to the information recording medium; and

tracking means 57 which detects a light beam transmitted through or reflected from the information recording medium, which has passed through the optical slit, and performs a tracking operation of the recording tracks based on the transmitted light or the reflected light as detected,

wherein the optical slit has a light emitting section whose width is shorter than the diffraction limit (see column 5, lines 52-55).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a

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person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ueyanagi in view of Mandella (U.S. Pat. 6,181,478).

Regarding claim 15, Ueyanagi discloses the information writing/reading device described above. Ueyanagi does not specifically disclose that the optical system further includes an optical fiber, and that the light beam is guided to the light incident section of the optical slit via the optical fiber. Mandella discloses an information writing/reading device (figure 8) comprising an optical fiber 170 and the light beam is guided to the light incident section of the optical slit via the optical fiber. It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the information writing/reading device of Ueyanagi with the optical fiber and the light beam guided to the light incident section of the optical slit via the optical fiber as taught by Mandella.

The rationale is as follows: one of ordinary skill in the art would have been motivated to provide the information writing/reading device of Ueyanagi with the optical fiber and the light beam guided to the light incident section of the optical slit via the optical fiber as taught by Mandella, as doing this would allow to maintain the polarization between the laser and the slit.

10. Claims 4-5 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hasegawa et al in view of Kino (U.S. Pat. 5,689,480).

Regarding claims 4-5 and 25, Hasegawa does not specifically disclose that the optical slit is formed in such a manner that its longitudinal direction is substantially parallel to a

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polarized direction of the incident light beam. Kino discloses a magneto-optic recording system (figures 1-5) employing near field optics, comprising an optical slit with its longitudinal direction parallel to a polarized direction of the incident beam. It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the information write/read head of Hasegawa with the optical slit formed in such a manner that its longitudinal direction is substantially parallel to a polarized direction of the incident light beam as taught by Kino.

The rationale is as follows: One of ordinary skill in the art would have been motivated to provide the information write/read head of Hasegawa with the optical slit formed in such a manner that its longitudinal direction is substantially parallel to a polarized direction of the incident light beam as taught by Kino as doing this would allow a high illumination efficiency at the end of the slit.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Ueyanagi (U.S. Pat. 6,687,196) discloses a method and apparatus for implementing high density recording on a recording medium; Fujimaki et al (U.S. Pat. 6,567,347) discloses an optical head having a plurality of coil elements connected in parallel to each other; Yoshida et al (U.S. Pat. 6,288,981) discloses a magneto-optical recording device using magnetoresistive head; Kino (U.S. Pat. 5,982,716; 5,883,872; 5,859,814) discloses a magneto-optic recording system; Lee (U.S. Pat. 5,161,134) discloses a method for increasing linear bit density in a magneto-optical storage media.

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12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Angel A Castro whose telephone number is 703-308-8435. The examiner can normally be reached on Monday through Thursday, 8 AM to 6 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William R Korzuch can be reached on 703-305-6137. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Angel Castro, Ph.D.